as Tyndall informs us, he retained the term "Natural Philosophy," usual in England to express physical science, and the name "Philosopher" for the cultivator of that science—lies essentially in the nature of his work. After the science of our age, in its laudable efforts to make human knowledge a true image of the actual universe, had shattered many an old metaphysical idol, it halted amid the transmitted forms of physical ideas regarding Matter, Force, Atoms, and Imponderables. These names were even converted into new metaphysical shibboleths by those who thought themselves most advanced in the way of enlightenment. It was these ideas that Faraday sought in his riper labours to purify from everything theoretical, which was not the true and immediate expression of the facts. More especially he opposed the action of forces at a distance, the assumption of two electric fluids and of two magnetic fluids, and, in like manner, all hypotheses which contradicted the law of the conservation of force, of which he had an early presage, though he singularly misapprehended its mathematical expression. And in these precise directions he exercised, in the first place, the most unmistakeable influence on the physicists of England. The mathematicians among them, especially, labour to render theories of phenomena the pure and true expression of the laws of fact, to the exclusion of all arbitrary theoretic devices. In this way Faraday's ideas, though in a modified form, often reveal themselves with their true significance assigned to them."

EARTHQUAKE OF OCTOBER 20, 1870

WE have been favoured with the following particulars of this earthquake by Prof. Newton, of Cambridge, U.S.A. :—

On Thursday morning, Oct. 20, an earthquake vibration was felt throughout Canada, and the northern part of the United States from Maine to Iowa. It seems to have been more severe in Canada and in New England. In many places the shock was sufficient to throw down chimneys, crack the walls of buildings, and do other damage. It was remarkably severe for the region of country visited. At New Haven, as well as in many other places, there were two distinct series of vibrations. Prof. Twining has carefully collected information from several persons as to the time of the occurrence and duration of the vibrations. The beginning of the first shock was at $11^h\ 19^m\ 45^s$ A.M. New Haven mean time. It lasted ten seconds, and its individual vibrations were about two-thirds of a second in duration, or one and one-third second for a complete double vibration. After an interval of five seconds there was a second series like the first lasting eleven seconds. The motion was not a simple oscillation, but there was a rocking motion, indicating a vertical component in the movement of the earth. The vibrations were not severe enough to arrest universal attention, though multitudes felt a peculiar sensation without recognising the cause. The direction of the vibration was N.N.E. to S.S.E. At Cambridge, Mass., according to Prof. Winlock, the direction was about 10° north of east, as determined by the appearance of the sides of a vessel containing milk. Mr. Farmer, at Boston, gives $11^h\ 25^m\ 37^s$ for the time of the ending of the vibrations, Cambridge mean time. This would imply that the shock reached Boston a minute and three-fourths earlier than New Haven. At Cleveland, Ohio, several clocks were stopped by the earthquake, each indicating very nearly $10^h\ 45^m$ A.M. This is approximately the instant at which the shock reached New Haven. It is reported that the shock reached Quebec 30 seconds before it did Montreal, the telegraph operator of the former city being in the act of inquiring of the operator in the latter one respecting the earthquake, when it arrived at Montreal. These data seem to show that the general progress of the wave was from North to South. Slight vibrations were felt as far south as Richmond, Va., and as far west as Dubuque, Iowa.

NOVEMBER METEORS OBSERVED AT THE RADCLIFFE OBSERVATORY

THE following is a list of Meteors observed at this Observatory by Mr. Lucas, on the nights of November 12, 13, and 14, 1870.

On Nov. 12 a watch was kept from $7^h\ 15^m$ to $8^h\ 30^m$, and from 11^h to $13^h\ 30^m$.

At $8^h\ 20^m$ a meteor was seen of the 4th magnitude, from Capella, a little to northward.

At $12^h\ 29^m$, one of the 1st magnitude, white, flashed from α Cephei to α Cygni.

At $12^h\ 48^m$, one of the 1st magnitude, from α Ursæ Majoris to Polaris, below the stratus cloud which overspread the sky, and nearly hid all the stars, the two mentioned being just visible. Duration, $1^s{\cdot}5$.

At $12^h\ 57^m$, one of the 1st magnitude, white, seen for an instant about 7° or 8° east of Polaris, appearing to burst over the point of appearance ; motion southwards.

Nov. 13.—At $8^h\ 5^m$, one of the 3rd magnitude, visible for 3^s, downwards towards the south.

At $8^h\ 20^m$, one of the 1st magnitude, visible for 2^s, with a long train, from ϵ Cygni to α Aquilæ.

At $9^h\ 38^m$, brighter than Jupiter, of a blue colour, visible for 4^s, from near Capella to o Ursæ Majoris.

The sky was overcast at $11^h\ 30^m$, and continued so nearly all the night, raining from 14^m to 16^m.

Nov. 14.—At $10^h\ 54^m$, one of the 1st magnitude, white, visible for $1^s{\cdot}5$. From β Aurigæ to a cloud near 25 Lynxis ; direction, N.E.

At $11^h\ 1^m$, one of the 1st magnitude, visible for $1^s{\cdot}5$. From a cloud a little to the west of Rigal ; downwards.

At $11^h\ 19^m$, one of the 1st magnitude, visible for 2^s ; near ι and χ Andromedæ to α Cygni.

At $12^h\ 33^m$, one of the 4th magnitude. From α Cephei downwards ; a short path.

Cloudy from 10^h to $11^h\ 30^m$; tolerably fine afterwards till 13, when clouds covered the sky again.

ROBERT MAIN

NOTES

WE are glad to announce that the Government has expressed its intention to aid in the most ample manner the proposed Eclipse Expeditions. In making this announcement we feel that what has recently appeared in the daily Press renders certain explanations desirable, which otherwise might have been omitted. In our last number we stated that deputations had been appointed both by the Joint Committee and the Council of the British Association to wait upon Mr. Gladstone. To this we must now add that the letter of the Secretary of the Joint Committee, which was to ask Mr. Gladstone to appoint a time to receive a deputation, was not sent to Mr. Gladstone, and did not ask that a time should be named ; in fact it was a letter sent to the *Treasury*, apparently only for their information, and was nothing more than a copy of the resolution passed at the meeting of the Joint Committee. After a week had elapsed without any answer being received by the Joint Committee to the letter which it was supposed had been sent to Mr. Gladstone, asking him to name a time for a deputation; a member of the Joint Committee, Mr. Lockyer, called at the Treasury to inquire the reason of the delay in the answer, and of course he was informed that no letter had been received requiring any answer. Upon it being represented that a delay in the announcement of the Government intentions until a proper letter could be received from the Secretary of the Royal Society would be fatal to the Expedition, Mr. Lockyer was requested to state the actual requirements of the Scientific Bodies to Mr. Lowe, and upon his having done so, the Chancellor of the Exchequer, who, so far as we know, heard then of the expedition for the first time, at once expressed his opinion that such an expedition was one eminently worthy of Government aid, and that the Government would do all that was requisite to further the objects sought. This decision of the Government was announced to the Royal Astronomical Society by the Astronomer Royal on Friday last, and since then, the arrangements for the Expedition have moved apace. There will be a ship furnished by the Government to carry observers to Spain. There will be funds to convey observers overland to Naples, and a ship to carry them on to Messina. The various European governments have been requested to aid the various parties, and, generally, the influence of the Government is being brought to bear in every way. This taken in connection with what has appeared in these columns before, and a letter which the Astronomer Royal has addressed to the *Daily News*, shows that now all the facts are out, the whole blame of the long delay must fall on the officers of the Joint Committee, who, apparently unable to perform the duties entrusted to them, still did not call the Committee together to receive instructions. We should not write in so decided a tone on such a painful subject did we not feel that it is simply an act of justice to the Government to state, as plainly as our information enables us to do, exactly where the real blame rests.

IT will have been observed that Dr. Carpenter's letter in our number for Oct. 27, called in question, on the authority of Sir R. I. Murchison, the accuracy of our report of the conversation which followed the reading of Mr. Gwyn Jeffreys' paper in Section C of the British Association. We have communicated, in consequence, with Mr. Jeffreys, by whom we were favoured with the report in question, and who assures us that "to the best of his recollection and belief the report was quite accurate as conveying the purport of Sir Roderick Murchison's remark." While, therefore, we are unable to decide the relative accuracy of two different recollections of the same circumstance, we cannot but congratulate ourselves that the misunderstanding, if it were so, has drawn out such a full exposition of Dr. Carpenter's views of the bearings of the *Porcupine* discoveries on modern geological and physico-geographical theories.

IN addition to the notices of papers to be read at the meetings of the scientific societies in London, we shall be glad to insert in our "Diary" the titles of those to be read at the leading provincial societies, when of sufficient interest, and if forwarded to us in good time.

BRASENOSE College, Oxford, offers an open fellowship for Natural Science or Mathematics in February next. Candidates for Natural Science must communicate with the Principal by letter not later than the 20th December. As this is one of the few colleges which have hitherto held entirely aloof from Natural Science, this fellowship is clear evidence that the value of such studies is yearly becoming more appreciated at Oxford.

THERE will be offered for competition, at St. John's College, Cambridge, in 1871, an Exhibition of 50*l.* per annum for proficiency in Natural Science, the Exhibition to be tenable for three years in case the Exhibitioner have passed within two years the previous examination as required for candidates for honours: otherwise the Exhibition to cease at the end of two years. The candidates will be examined in (1) Chemistry, including practical work in the laboratory: (2) Physics, viz., electricity, heat, light; (3) Physiology. They will also have the opportunity of being examined in one or more of the following subjects—(4) Geology, (5) Anatomy, (6) Botany, provided that they give notice of the subjects in which they wish to be examined four weeks prior to the examination. No candidate will be examined in more than three of these six subjects, whereof one at least must be chosen from the former group. It is the wish of the masters and seniors that excellence in some single department should be specially regarded by the candidates. They may also, if they think fit, offer themselves for examination in any of the classical or mathematical subjects. The Exhibitions are not limited in respect to the age of candidates. The examination will take place on April 21st and 22nd, and the names of candidates must be sent in at least ten days beforehand.

THE series of science lectures addressed to working men at Manchester are a great success. Three weeks ago Prof. Huxley opened the series by a very interesting lecture on Coral Islands. On Wednesday se'nnight, Prof. Roscoe lectured on Spectrum Analysis, and this week Mr. Huggins lectured on the Spectrum Analysis of the Stars. These lectures, which are to be continued through the winter, have been literally crowded by most attentive audiences, and since full reports are published in the Manchester daily papers, there is every hope that much permanent benefit will be derived from them.

THE following are the lecture arrangements at the Royal Institution of Great Britain for 1870-71:—Christmas lectures (adapted to a juvenile auditory), Prof. Odling—Six lectures "On Burning and Unburning," on Dec. 27, 29, 31, 1870; Jan. 3, 5, 7, 1871. Before Easter, 1871, Prof. Michael Foster—Eleven lectures "On the Nutrition of Animals," on Tuesdays, Jan. 17 to March 28; Prof. Odling—Eleven lectures "On Davy's Discoveries in Chemistry," on Thursdays, Jan. 19 to March 30: Mr. W. H. Channing—Four lectures "On the Progress of Civilisation," on Saturdays, Jan. 21 to Feb. 11; Prof. Jowett—Three lectures "On Socrates," on Saturdays, Feb. 18, 25, and March 4; Mr. H. O'Neil—Four lectures "On the Spirit of the Age," on Saturdays, March 11 to April 1. The Friday evening meetings will commence on Jan. 20. The Friday evening discourses before Easter will probably be given by Profs. Tyndall and Odling, the Dean of Westminster, Mr. E. J. Reed, Mr. James W. Douglas, Dr. Carpenter, Capt. Noble, Prof. Clerk Maxwell, Mr. Norman Lockyer, and Mr. W. Mattieu Williams. After Easter:—Prof. J. J. Sylvester—Three lectures "On Emanuel Kant," on Tuesdays, April 18, 25, and May 2. Mr. Charles Brooke—Two lectures "On Force and Energy," on Tuesdays, May 9 and 16. Prof. Tyndall—Eight lectures, on Thursdays, April 20 to June 8. Mr. Norman Lockyer—Eight lectures "On Astronomy," on Saturdays, April 22 to June 10.

THE *British Medical Journal* reports that at a meeting of a committee held in Edinburgh on November 7, it was stated that the form of the national memorial to the late Sir James Y. Simpson had been agreed upon as follows: 1. A monument and statue in Edinburgh; 2. A marble bust in Westminster Abbey; 3. A hospital in Edinburgh for the diseases of women, constructed on those principles which Sir James so often and so clearly enforced; 4. Similar hospitals in London and Dublin, should sufficient funds be obtained. It was also stated that a sum of 1,950*l.* had already been subscribed.

AFTER the conclusion of the ordinary business of the meeting of the Royal Medical and Chirurgical Society on Tuesday the 8th inst., the meeting was made special for the purpose of confirming, or rejecting, the following resolution, proposed by Mr. Paget, seconded by Dr. Quain, and passed at a special meeting of the Society on October 25th:—"That the Council be requested to consider whether, while maintaining the charter and constitution of the Royal Medical and Chirurgical Society, it may be possible to obtain a more complete co-operation with the Pathological, Obstetrical, Clinical, and Epidemiological, or other societies for the promotion of Medical Science." After a lengthened debate, Dr. Paget's resolution was confirmed by a small majority.

THE *Chemical News* gives a short account of a convenient form of spectroscope for use in a laboratory, by Mr. John Browning. It is so constructed that it may be kept in close proximity to a chemical laboratory without injury. The prism is provided with a cover, which should be put on with a little bees'-wax; or, better still, bees'-wax and tallow. This prism, with cover complete, can be removed, and replaced without deranging the adjustment of the instrument, to allow of a bottle prism being substituted for the purpose of taking the refractive index or dispersive power of any liquid. The stand of the instrument is of wood, and the whole is enclosed in a circular cover which fits tightly round the base of the instrument, and has no other joint or opening.

THE Leeds Naturalists' Field Club will hold the following conversational open meetings, at the Rooms, South Parade, every alternate Monday evening, at eight o'clock:—(1870), November 7, "A November Day at Boston Spa," Mr. J. W. Taylor; November 21, "Geology as a Study," Mr. L. Acomb; December 5, "Life History of the Painted Lady Butterfly (*Vanessa Cardui*)," Mr. W. Turner; December 19, "Animalculæ," Mr. W. Coates; (1871), January 2, "The History of a Mushroom," Mr. J. Abbot; January 16, "Wasps," Mr. W. D. Roebuck; January 30, "Our Trees and their Uses," Mr. Jas. Brodie; February 13, "Protozoa," Mr. T. Hick, B.A.

THE Annual Exhibition of the Photographic Society of London was opened at the Architects' Gallery, No. 9, Conduit Street, by a private reception of their friends by the members of the Society, and the exhibition will remain open to the public until the last day of the current month of November. The exhibition is quite as large as was the eminently successful exhibition of last year, and certainly leaves the impression that there is manifest and unmistakeable evidence of progress in the art during the year. The work of many of the leading and best known exhibitors is in advance of their exhibited specimens of the last year, and there are some individual photographs now to be seen upon the walls of the gallery which it can hardly be too much to say are of higher excellence, both as pictures and as photographs, than any that have before been produced. We may mention in particular ten large portraits by Col. Stuart Wortley, taken direct from life, and marvellous specimens of tasteful and exquisite portraiture; two large portraits, also from life, by Mr. Warwick Brookes, of scarcely inferior power and excellence; Vandyke and Brown's solar camera enlargements of the poet Longfellow; and Mr. Blanchard's large Rembrandtesque life portraits. Of large landscape work, Mr. Care, of Worcester, deserves special notice; and Mr. Robinson's sea pieces, "Turn of the Tide" and "Outward Bound," are admirable bits of true nature. Mr. Robert Faulkner has some very pretty applications of the instantaneous branch of the art in catching the fitful aspects and characteristics of children; and Mr. Vernon Heath has two exquisite bits of true scenery and foliage; nor ought we to pass by "Hop-picking," by Mr. Stephen Thompson, and Captain Lyons' Indian pictures; and we may add to this list Mr. Manners Gordon's small pictures from dry plates.

HERR A. PETERMANN has published a brief paper, in which he recapitulates the main results of the various North Pole Expeditions of the present year. Herr von Heuglin and Count Zeil, of the German Expedition, remained from July 15 till Sept. 15 in and near East Spitzbergen, which they explored, mostly in boats, from 77° to 79° N. lat. They claim to have discovered extensive land to the east of Spitzbergen. This land, Herr Petermann maintains, it is a mistake to identify with the land discovered by Gillis in 1707, which lay 80° N. lat. The land which was seen from the White Mountain of Spitzbergen by the Swedish Expedition in 1864, 80 nautical miles to the east, was put down on the map as a neck of land lying 79° N. lat. "Herr von Heuglin and Count Zeil," says Herr Petermann, "have now discovered, 36 nautical miles to the east of Spitzbergen, a continent, extending from 79° to 78° N. lat.—therefore, from north to south, at least 60 (German) miles—which contains numerous sharply-pointed peaks, and which, in case it is really connected with Gillis Land, might at least equal Spitzbergen in size." This is claimed as the most important polar discovery that has been made for some years. Herr Heuglin has brought home with him from East Spitzbergen fourteen chests of geological, zoological, and botanical specimens. The news of the war reached the explorers in September. Count Zeil, a lieutenant in the Second Royal Würtemberg Jäger Battalion, at once hastened home to Stuttgart, and, having had an audience of the King on October 20, proceeded forthwith to his regiment in France. Herr Petermann announces that the Russian Expedition, which has been accompanied by the famous academician, Von Middendorff, has prosecuted interesting scientific researches between Novaia Zemlia and Iceland. Among other things, it is said, he has identified the Gulf-Stream as far as Novaia Zemlia at the very considerable temperature of + 10° Réaumur. With reference to an article by Herr Petermann on the subject of the Gulf-Stream, Herr von Middendorff writes to him:—"I am extremely glad that your theory respecting the extension of the Gulf-Stream is not only confirmed, but has even been greatly surpassed; you were bold, but Mother Nature is still bolder."

AT a time when so much is being said about the value of fungi in general as profitable and wholesome articles of food, and also when France is being so largely overrun by foreign troops, the following notes on the Truffle cultivation in the Department of the Dordogne, written a short time before the outbreak of the present war, may be of some interest. It shows the money value of these delicacies, and how profitable a business is their cultivation. The method adopted for propagating them is to sow acorns, and the best truffles are found under the resulting oak-trees; but the evergreen oak, and juniper trees are also grown for the same purpose. An instance is cited of a person who inherited a piece of land worth 8*l.*, and who thus sowed it with acorns; the truffles thereby obtained realise now as much as 160*l.* a year. There are many varieties easily distinguishable to those accustomed to the trade. The truffle is dearer in Périgord than in Paris, where it is mixed with an inferior quality, and therefore can be sold at a lower price. It comes to perfection about the middle of November, but large quantities are collected and sent to market in September and October. These are called "fleurs," and are without smell. It is pretended that they have not come to maturity, and that a large portion of the produce is thus spoilt. The total revenue derived from the truffle commerce amounts to 20,000*l.* a year in the Arrondissement of Tarlat, and to about the same amount in Périgueux.

IT is interesting to note the progress the Japanese are making in the art of printing, &c. Hitherto they have only been acquainted with the Chinese mode of printing, from engraved wooden blocks. Lately, however, they have engaged the services of an English gentleman, to set up for them an establishment for type-founding, electrotyping, and printing on the Western method, and to give them such instructions in these arts as will enable them afterwards to carry on the business. Type-founding and electrotyping have now for the first time been introduced into Japan.

AT the last ordinary meeting of the Hackney Scientific Association, held on Nov. 8th, Mr. Henry T. Vivian announced that he had discovered the variability of ϵ Herculis, a small star to the N.E. of π. From observations extending back to the autumn of last year, he had deduced a period of about 21 days, with probably a second longer period. The amount of variability in the star's lustre is from a large 5th mag. to a small 6th. The star is numbered 60 in Map 10 of Mr. Proctor's New Star Atlas, although in Map 8 it is numbered 69; evidently an error on the part of the engraver.